OPERATING AND MAINTENANCE MANUAL
FOR

502 SERIES HOT PLATE/STIRRER

DOCUMENT NUMBER 502-01
REVISION A

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TOOLS FOR SERVICE + REPAIR

(1) NO SPECIAL TOOLS

RECOMMENDED TOOLS

(A) MEDIUM PHILLIPS HEAD SCREWDRIVER

(B) SMALL STRAIGHT SLOT SCREWDRIVER

(C) 6" CRESCENT WRENCH

(D) MEDIUM SIZE STANDARD PLIERS

(E) AMP "SUPER CHAMP" WIRE CUTTER, STRIPPER, CRIMPER

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I. INTRODUCTION

Congratulations on your purchase of a PMC Industries, Inc. Hot Plate/ Stirrer. Please read the instructions carefully to insure that you receive the maximum benefit from it.

II. WARRANTY

All PMC Hot Plate/Stirrers are warranted for a period of 13 months from the date of purchase against defects due to parts failure or faulty workmanship. If a failure occurs, contact the distributor from whom you purchased the unit. Any attempt to repair the unit or breaking any of the seals on the unit without consulting your distributor may result in voiding of your warranty. The warranty may also be voided by misuse or mishandling on the part of the user. Be careful of spills. Although the unit is designed to help keep spills from getting inside the case, care must be taken to wipe up spills quickly.

If you receive your unit damaged, report the damage immediately to the carrier and file a claim with the carrier. It is a good idea to photograph the damaged package for your records.

If, for any reason, you feel servicing is necessary, call the distributor from whom you bought the unit. He will advise if he can undertake the service or if the unit requires servicing by the manufacturer. It is suggested that you SAVE THE ORIGINAL PACKING. All warranty claims are subject to review and approval by the manufacturer.

For further information or advice, direct correspondence to:

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III. CAUTIONS

HEATER PLATE SURFACE

The PMC Hot Plate/Stirrer is capable of temperatures in excess of 400°C at the plate surface. Touching the heated surface will cause severe burns. USE EXTREME CAUTION AT ALL TIMES. Never leave your Hot Plate/Stirrer accessible to others while it is hot. Never touch the heating surface unless you are absolutely sure that it is cool.

ELECTRICAL

The PMC Hot Plate/Stirrer is made in models that operate at 100, 115 and 230 volts AC. Be certain that your voltage matches the unit that you receive. Check the plate on the bottom for the voltage setting on your unit. Take the normal care and precaution one would use with any electrical appliance. Be very careful to keep the AC line cord away from the hot plate.

IV. OPERATING INSTRUCTIONS

On the Model 502 Hot Plate/Stirrer the heater or stirrer may be operated alone or together as you choose. The light on the front panel will indicate the function that is activated (green light--stirrer, red light--heater).

Heater: The heater operates from a rotary dial that has three detents: LO, HI, and OFF. At OFF no current is applied to the heater. At LO the heater has minimum warming current applied. At HI the unit has maximum current applied. Between HI and LO there are five (5) marks on the front panel. These are for reference only. The control will rotate smoothly through this portion of its rotation.

To set a specific temperature, place a glass or electronic thermometer into the solution. Turn the heater dial on and observe the temperature of the solution increase. Try to judge when the heater setting should be changed to have the solution reach the desired temperature with minimum overshoot. Once equilibrium has been reached, the unit will hold the desired temperature to within ±3°C. Stirring the solution is advised to minimize temperature gradients.

Stirrer: The stirrer control has an OFF detent fully counterclockwise and 11 marks between minimum and maximum speed. The control will rotate smoothly from minimum to maximum after the initial ON detent is passed. The unit can stir most aqueous solutions from below 100 RPM to 1500 RPM.

The stirrer turns on at minimum speed and increases speed as the dial is turned clockwise. Try to select a combination of stir bar and stirring speed that is optimum for your solution.

V. MAINTENANCE

The 502 Series Hot Plate/Stirrers are simple to maintain. There are four essential elements to the unit. They are the stirrer control, the stirrer motor, the heater control, and the heater element. There is no preventative maintenance other than keeping the unit clean and keeping spills off the control surfaces. Always clean spills quickly.

To identify potential problems use the following chart.

SYMPTOM	POSSIBLE TROUBLE
Heater and stirrer lights do not illuminate when on and the unit shows no signs of heating and stirring.	Fuses blown. Unplug unit and check fuses. If blown replace and try unit again. If fuses blow again, check: motor coil for short (should read about 25 to 35 ohms) or heater for short to chassis ground. Replace heater or motor.
Stirrer operates, but heater does not.	Check heater coils for open. If open replace heater. Good heater reads about 20 ohms in porcelain top on 100VAC and 115VAC units, and about 40 ohms on 230VAC units. Aluminum top units read about 100 ohms. Bad elements will almost always read open. Replace bad element. Please note that heater control will almost never fail.
Heater operates, but stirrer does not.	Check to see if motor or magnet are impaired from stirring by rubbing on case or from foreign matter obstructing movement. Check motor coil for open. Replace motor if coil open or reading is above 50 ohms. If problem persists, replace motor speed control.

PMC INDUSTRIES, INC

B I L L O F M A T E R I A L

********** L E V E L 1 O N L Y **********

02-28-89

502P	HOTPLATE/STIR, PORC, 115V	SUBASSEMBLY:	
LEVEL: 1	PAGE: 1	USED ON:	

PART/SUB NUMBER	TYPE	DESCRIPTION	VENDOR	QTY REQD	
001-0031	P	TERMINAL, 14-16, SO, .250	4080	4	
001-0032	P	TERMINAL, 18-22, SO, .250	5746	4	
027-0004	P	TERMINAL, BUTT SPLICE	4080	1	
400-0012	P	BAG, PLASTIC, 13 X 4 X 18	7412	1	
420-0012	P	FEET, SELF STICK	6052	4	
420-0041	P	TERMINAL, PIGTAIL, NP5670	5848	1	
430-0006	P	MOTOR, 115 VAC, S58-212	4420	1	
440-0018	P	SPACER, TEFLON 5/8 #6	2992	4	
440-0035	P	TERMINAL RING #8 STUD	4080	2	
440-0054	P	POWER CORD, 18/3 SVT 7 FT	0544	1	
440-0055	P	STRAIN RELIEF	6052	1	
440-0089	P	WIRE, 18AWG TEF GR/YEL IN	7038	9	
440-0254	P	WIRE, 18 AWG, ORANGE 7 IN	7140	1	
440-0268	P	WIRE 18 AWG GREEN/YEL 2	0952	1	
500-0002	P	FRONT PANEL, PLATED	5134	1	
500-0004	P	REAR PANEL, ANODIZED	4403	1	
500-0009	P	MOTOR SPEED CONTROL, 120V	2337	1	
500-0011	P	KNOB	6052	2	
500-0015	P	BOX, WHITE, PMC SINGLE	4003	1	
502-0003	P	OVERLAY, FRONT PANEL, PMC	3672	1	
502-0004	P	INDICATOR LIGHT, RED/GRN	8551	1	
502-0005	P	HEATER CONTROL, 115 VAC	7208	1	
710-0002	P	CASE, TOP, PAINTED	4378	1	1
710-0003	P	CASE, BOTTOM, PAINTED	4378	1	
710-0009	P	STIFFENER, ALUMINUM PLATE	5134	1	
710-0012	P	HEATER PLATE, PORCELAIN		1	
710-0013	P	ELEMENT SUPPORT, DURABORD	0002	1	
710-0015	P	ELEMENT, NICHROME TYPE C	2652	2	
710-0016	P	INSULATOR, CER PAPER 7-IN	0001	1	
710-0017	P	HEAT SHIELD #1	5134	1	
710-0018	P	HEAT SHIELD #2	5134	1	

CIRCLED ITEMS SHOULD BE AVAILABLE AS SPARES FOR POTENTIAL REPAIR

PMC INDUSTRIES, INC
BILL OF MATERIAL
********** LEVEL 1 ONLY **********
02-28-89

502P	HOTPLATE/STIR, PORC, 115V	SUBASSEMBLY:	
LEVEL: 1	PAGE: 2	USED ON:	

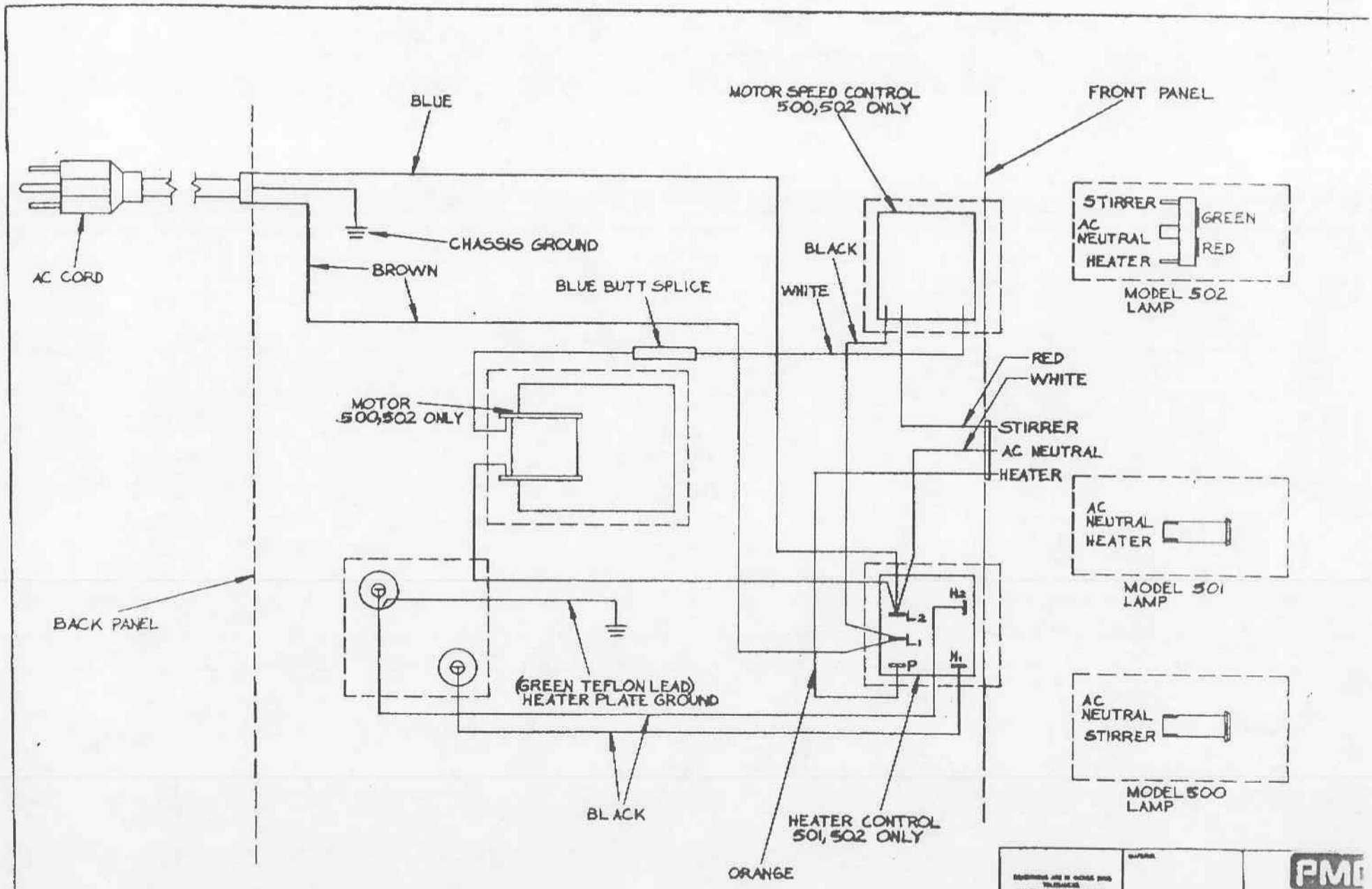
PART/SUB NUMBER	TYPE	DESCRIPTION	VENDOR	QTY REQD
710-0039	P	TERMINAL,BUTT SPLICE22-16	3060	4
710-0045	P	LABEL, REORDER, PMC	3672	1
710-0046	P	MAGNET, CERAMIC RING	6664	1
710-0047	P	MAGNET MOUNT	7225	1
710-0048	P	SHAFT COUPLER	7225	1
710-0050	P	FOAM PACKING SET	6366	1
710-0057	P	BUSHING, CERAMIC	4339	8
710-0060	P	WIRE, MGT, 18 AWG, BLUE	7044	26
710-0061	P	WIRE, MGT, 18 AWG	7044	20
710-0068	P	INSULATION, HI-TEMP	5100	4
710-0070	P	TERMINAL, 16-14 FISO .187	3060	1
710-0076	P	WARRANTY CARD, PMC	8058	1
8111-608O	P	632 X 1/4 M/S P/H PH BLK	8636	3
8111-812P	P	832 X 3/8 M/S P/H PHIL	8636	1
8111-816BN	P	832 X 1/2 M/S P/H BR PLTD	8636	8
8111-820P	P	832 X 5/8 M/S P/H PHIL	8636	8
8112-012P	P	1032 X 3/8 M/S F/H PHIL	8636	1
8199-608P	P	632 X 1/4 M/S HEX HD PHIL	7905	1
8199-632P	P	632 X 1 HEX MACHINE SLTD	8636	2
8210-0400	P	WASHER, #4 INTERNAL STAR	8636	2
8210-0600	P	WASHER, #6 INTERNAL STAR	8636	2
8210-0800	P	WASHER, #8 INTERNAL STAR	8636	10
8210-3700	P	WASHER, 3/8 INTERNAL STAR	8636	1
8220-080S	P	WASHER, #8 EXT STAR, SS	7905	8
8320-0400	P	NUT, 440 MACHINE, R/P	8636	2
8330-3724	P	NUT, JAM, 3/8 X 24	8636	1
8416-1875	P	SPACER 3/16L X 1/2 OD CER	7930	8
8528-5644	P	STANDOFF, HEX 8-32 X 9/16	2992	4
8833-2083	P	TERMINAL,RING,#8 HI-TEMP	4271	1

MATERIAL COST
DIRECT LABOR
FACTORY OVERHEAD

TOTAL COST

STANDARD COST

CIRCLED ITEMS SHOULD BE AVAILABLE AS SPARES FOR POTENTIAL REPAIR


BLUE
MOTOR SPEED CONTROL
500,502 ONLY
FRONT PANEL
STIRRER
AC
NEUTRAL
HEATER
GREEN
RED
MODEL 502
LAMP
AC CORD
CHASSIS GROUND
BROWN
BLUE BUTT SPLICE
BLACK
WHITE
RED
WHITE
MOTOR
500,502 ONLY
STIRRER
AC NEUTRAL
HEATER
AC
NEUTRAL
HEATER
MODEL 501
LAMP
BACK PANEL
H2
L2
L1
P
H1
(GREEN TEFLON LEAD)
HEATER PLATE GROUND
AC
NEUTRAL
STIRRER
MODEL 500
LAMP
BLACK
HEATER CONTROL
501, 502 ONLY
ORANGE
WIRING DIAGR
500-00